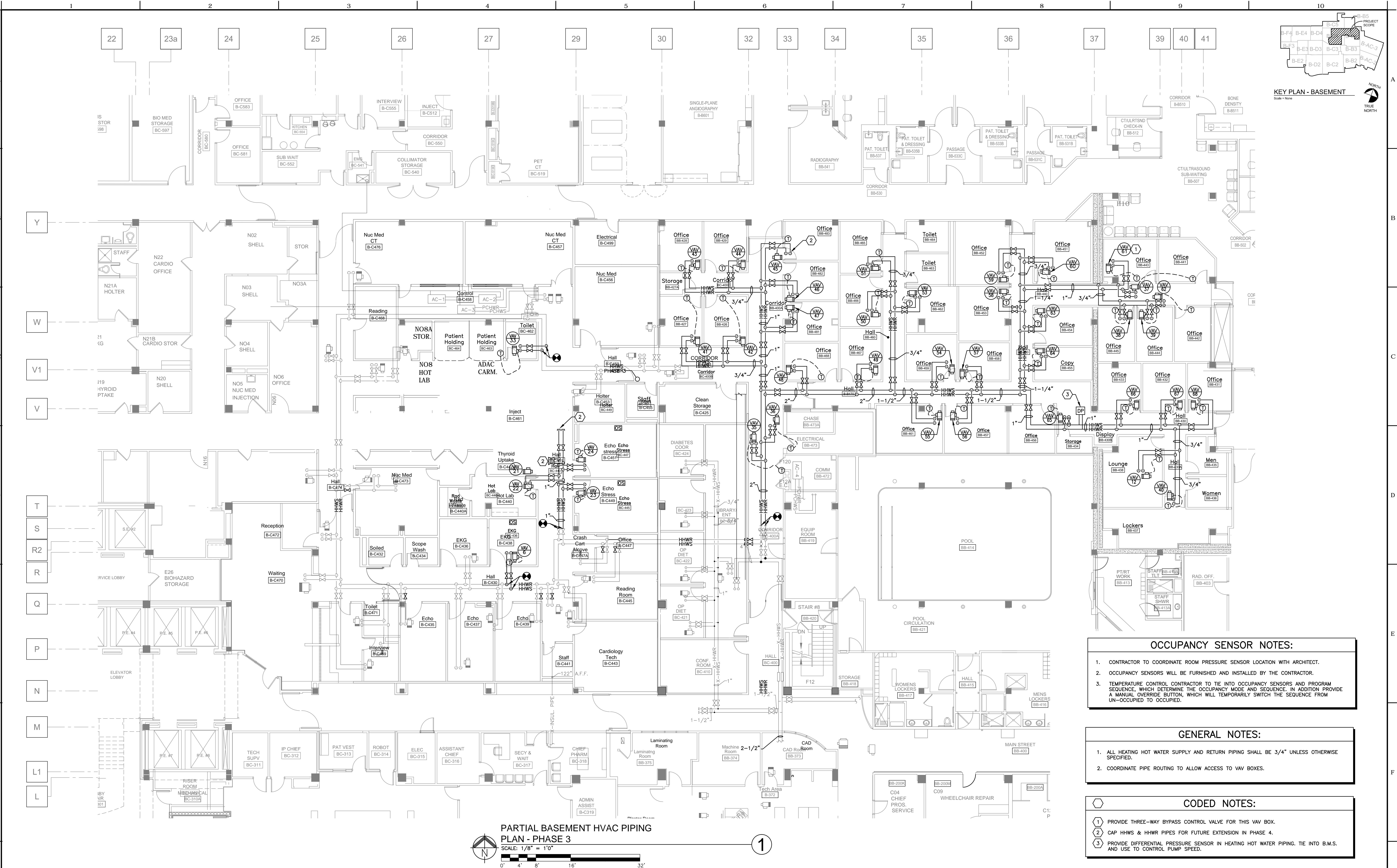


three inches = one foot  
one and one half inches = one foot  
one inch = one foot  
three quarters inch = one foot  
one half inch = one foot  
one quarter inch = one foot  
one eighth inch = one foot  
one sixteenth inch = one foot



PARTIAL BASEMENT HVAC  
PLAN - PHASE 3  
SCALE: 1/8" = 1'-0"

**OCCUPANCY SENSOR NOTES:**

1. CONTRACTOR TO COORDINATE ROOM PRESSURE SENSOR LOCATION WITH ARCHITECT.
2. OCCUPANCY SENSORS WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
3. TEMPERATURE CONTROL CONTRACTOR TO TIE INTO OCCUPANCY SENSORS AND PROGRAM SEQUENCE, WHICH DETERMINE THE OCCUPANCY MODE AND SEQUENCE. IN ADDITION PROVIDE A MANUAL OVERRIDE BUTTON, WHICH WILL TEMPORARILY SWITCH THE SEQUENCE FROM UN-OCCUPIED TO OCCUPIED.

**GENERAL NOTES:**

1. ALL HEATING HOT WATER SUPPLY AND RETURN PIPING SHALL BE 3/4" UNLESS OTHERWISE SPECIFIED.
2. COORDINATE PIPE ROUTING TO ALLOW ACCESS TO VAV BOXES.

**CODED NOTES:**

- 1 PROVIDE THREE-WAY BYPASS CONTROL VALVE FOR THIS VAV BOX.
- 2 CAP HHWS & HHWR PIPES FOR FUTURE EXTENSION IN PHASE 4.
- 3 PROVIDE DIFFERENTIAL PRESSURE SENSOR IN HEATING HOT WATER PIPING. TIE INTO B.M.S. AND USE TO CONTROL PUMP SPEED.

Bid Issue	01/17/14
Revisions:	Date

**CONSULTANTS:**

**FREDRICK, FREDRICK & HELLER**  
ENGINEERS, INC.  
672 EAST ROYALTON ROAD  
BROADVIEW HTS., OHIO 44147  
TEL (440) 546-8888  
FAX (440) 546-8888

**BARBER & HOFFMAN, INC.**  
Consulting Engineers  
2217 East 9th Street, Suite 350  
Cleveland OH 44115-1257  
216-875-0100 (F) 216-875-0111  
barberhoffman.com



**ARCHITECT:**

**Perspectus**  
architecture  
13212 Shaker Square Suite 204 Cleveland, Ohio 44120  
P. 216.752.1800 F. 216.752.3833

DESIGN AND CONSTRUCTION DOCUMENTS AS INSTRUMENTS OF SERVICE ARE GIVEN IN CONFIDENCE AND REMAIN THE PROPERTY OF PERSPECTUS ARCHITECTURE. THE USE OF THIS DESIGN AND THESE CONSTRUCTION DOCUMENTS FOR PURPOSES OTHER THAN THE SPECIFIC PROJECT NAMED HEREIN IS STRICTLY PROHIBITED WITHOUT THE EXPRESSED WRITTEN CONSENT OF PERSPECTUS ARCHITECTURE.

Drawing Title  
**PARTIAL BASEMENT HVAC  
PIPING PLAN - PHASE 3**

Approved: Project Director

Project Title  
**EXPAND AND RENOVATE  
NUCLEAR MEDICINE AND  
RADIOLOGY**

Location  
**VAMC - WADE PARK**

Date  
1-17-2014

Checked  
BMW

Drawn  
DAD

Project Number  
541-14-101

Building Number  
1

Drawing Number  
**1-H5.3**

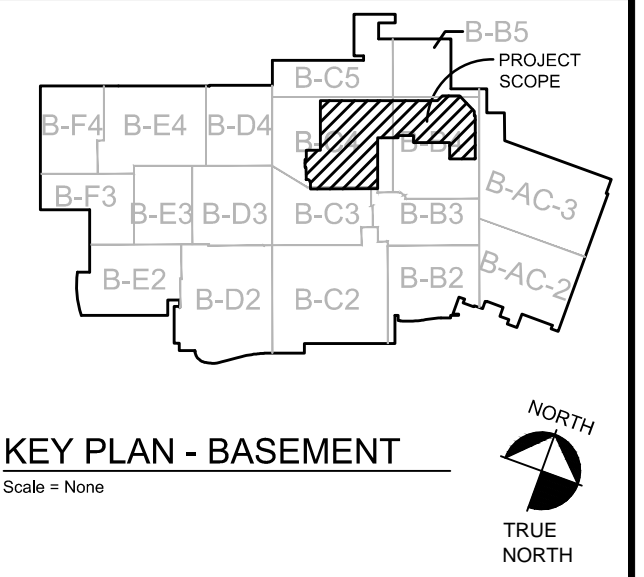
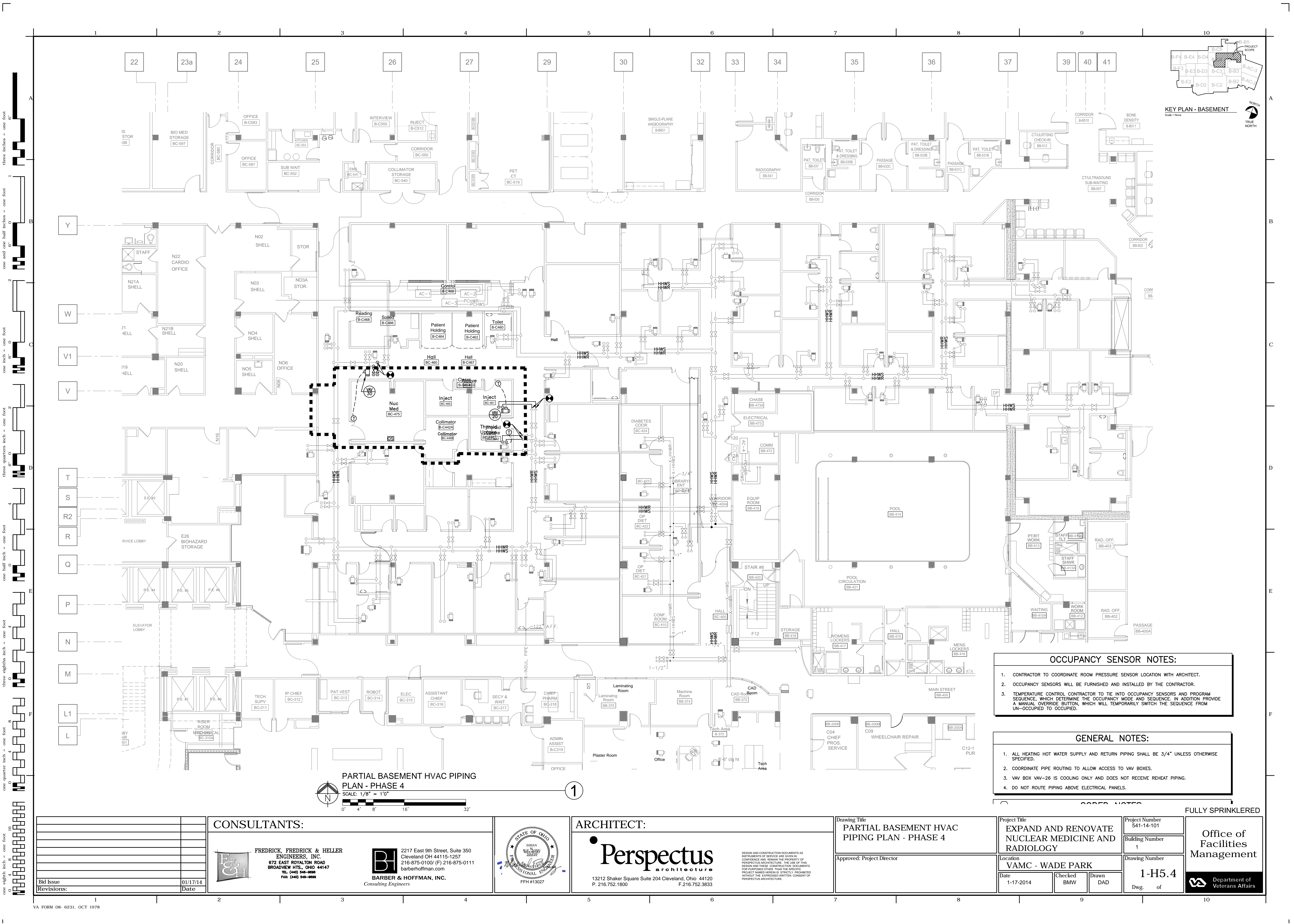
Dwg. of

**FULLY SPRINKLERED**

Office of  
Facilities  
Management

Department of  
Veterans Affairs





- OCCUPANCY SENSOR NOTES:**
1. CONTRACTOR TO COORDINATE ROOM PRESSURE SENSOR LOCATION WITH ARCHITECT.
  2. OCCUPANCY SENSORS WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
  3. TEMPERATURE CONTROL CONTRACTOR TO TIE INTO OCCUPANCY SENSORS AND PROGRAM SEQUENCE, WHICH DETERMINE THE OCCUPANCY MODE AND SEQUENCE. IN ADDITION PROVIDE A MANUAL OVERRIDE BUTTON, WHICH WILL TEMPORARILY SWITCH THE SEQUENCE FROM UN-OCCUPIED TO OCCUPIED.

- GENERAL NOTES:**
1. ALL HEATING HOT WATER SUPPLY AND RETURN PIPING SHALL BE 3/4" UNLESS OTHERWISE SPECIFIED.
  2. COORDINATE PIPE ROUTING TO ALLOW ACCESS TO VAV BOXES.
  3. VAV BOX VAV-26 IS COOLING ONLY AND DOES NOT RECEIVE REHEAT PIPING.
  4. DO NOT ROUTE PIPING ABOVE ELECTRICAL PANELS.

**CONSULTANTS:**

**FREDRICK, FREDRICK & HELLER  
ENGINEERS, INC.**  
672 EAST ROYALTON ROAD  
BROADVIEW HTS., OHIO 44147  
TEL. (440) 546-8888  
FAX: (440) 546-8888

**BARBER & HOFFMAN, INC.**  
Consulting Engineers  
2217 East 9th Street, Suite 350  
Cleveland OH 44115-1257  
216-875-0100/ (F) 216-875-0111  
barberhoffman.com



**ARCHITECT:**

**Perspectus  
architecture**  
13212 Shaker Square Suite 204 Cleveland, Ohio 44120  
P. 216.752.1800 F. 216.752.3833

DESIGN AND CONSTRUCTION DOCUMENTS ARE INSTRUMENTS OF SERVICE ARE GIVEN IN CONFIDENCE AND REMAIN THE PROPERTY OF PERSPECTUS ARCHITECTURE. THE USE OF THIS DESIGN AND THESE CONSTRUCTION DOCUMENTS FOR PURPOSES OTHER THAN THE SPECIFIC PROJECT NAMED HEREIN IS STRICTLY PROHIBITED WITHOUT THE EXPRESSED WRITTEN CONSENT OF PERSPECTUS ARCHITECTURE.

Drawing Title  
**PARTIAL BASEMENT HVAC  
PIPING PLAN - PHASE 4**

Approved: Project Director

Project Title  
**EXPAND AND RENOVATE  
NUCLEAR MEDICINE AND  
RADIOLOGY**

Location  
**VAMC - WADE PARK**

Date  
1-17-2014

Checked  
BMW

Drawn  
DAD

Project Number  
541-14-101

Building Number  
1

Drawing Number  
**1-H5.4**

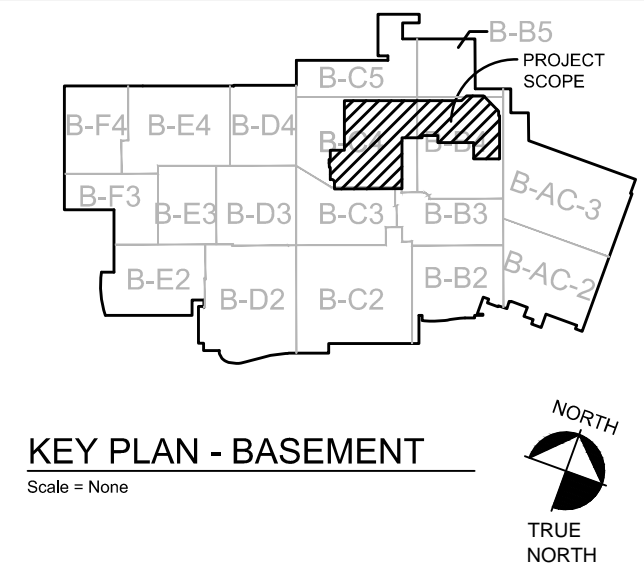
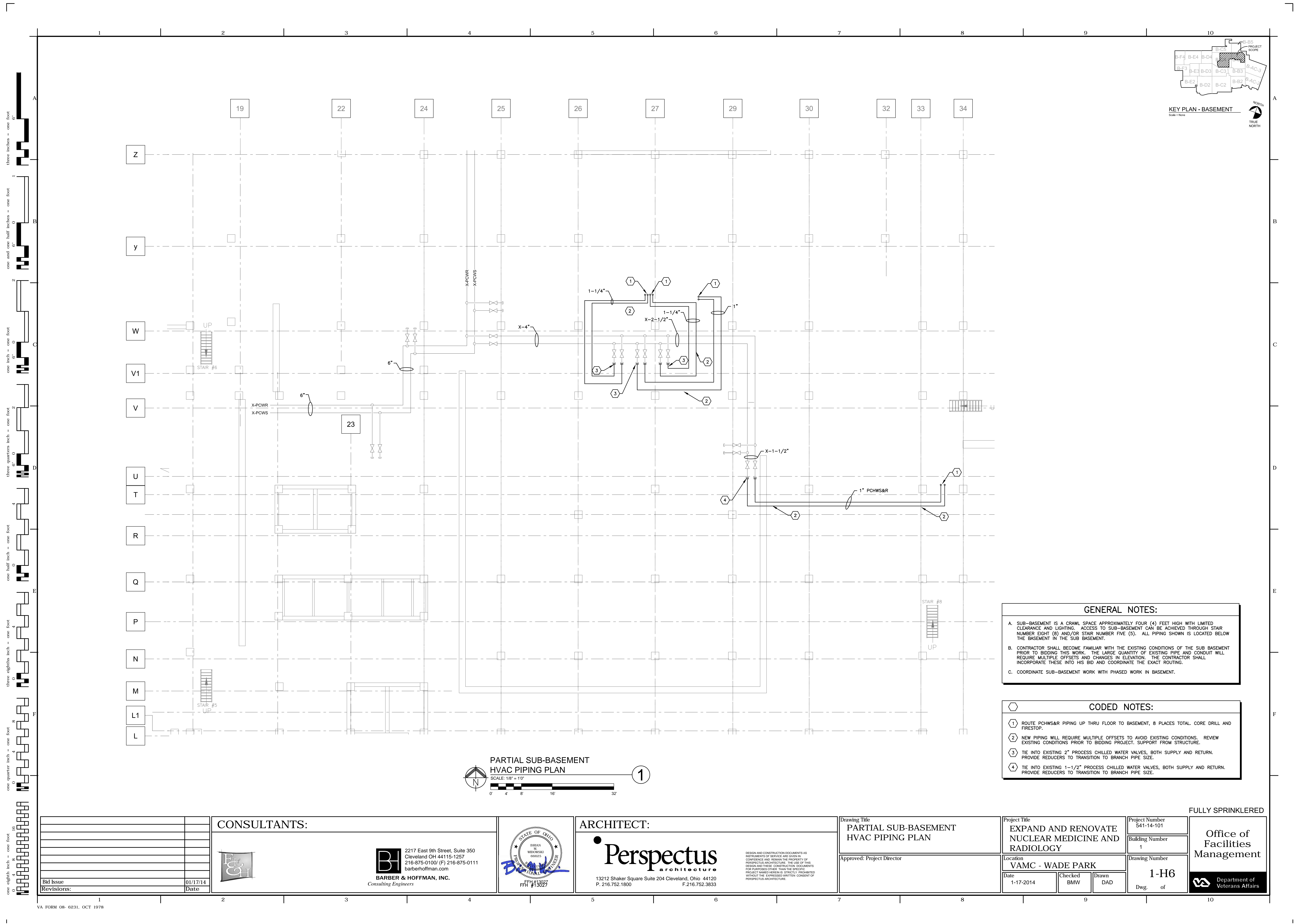
Dwg. of

FULLY SPRINKLERED

Office of  
Facilities  
Management

Department of  
Veterans Affairs



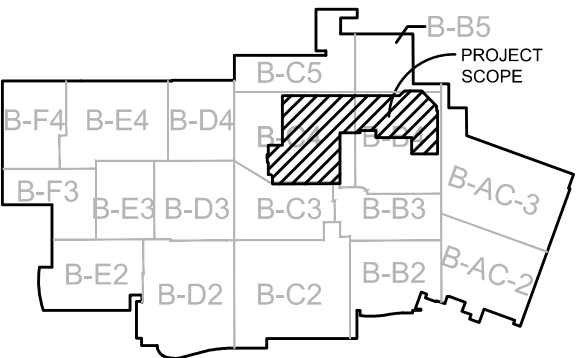
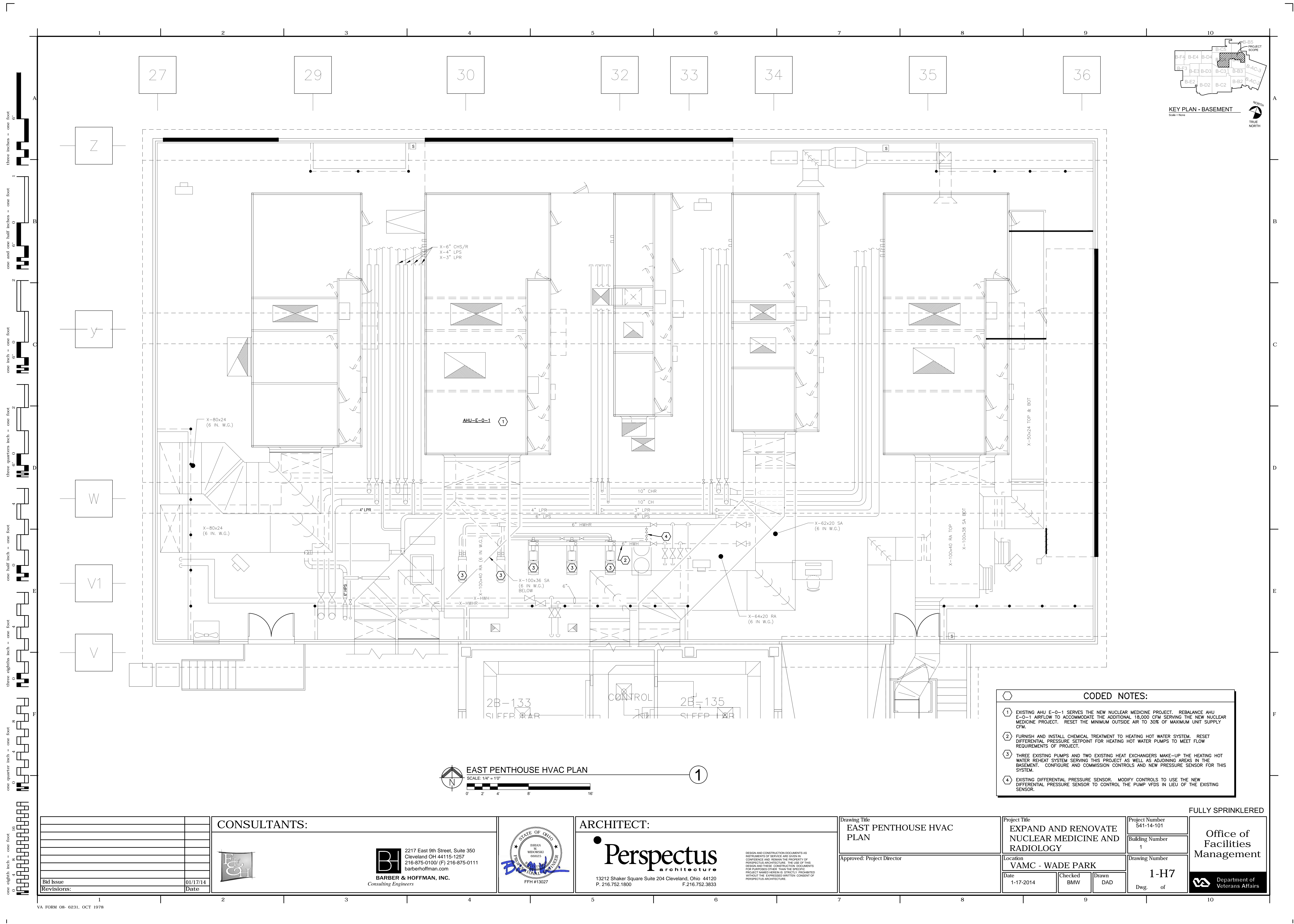


- GENERAL NOTES:**
- A. SUB-BASEMENT IS A CRAWL SPACE APPROXIMATELY FOUR (4) FEET HIGH WITH LIMITED CLEARANCE AND LIGHTING. ACCESS TO SUB-BASEMENT CAN BE ACHIEVED THROUGH STAIR NUMBER EIGHT (8) AND/OR STAIR NUMBER FIVE (5). ALL PIPING SHOWN IS LOCATED BELOW THE BASEMENT IN THE SUB-BASEMENT.
  - B. CONTRACTOR SHALL BECOME FAMILIAR WITH THE EXISTING CONDITIONS OF THE SUB-BASEMENT PRIOR TO BIDDING THIS WORK. THE LARGE QUANTITY OF EXISTING PIPE AND CONDUIT WILL REQUIRE MULTIPLE OFFSETS AND CHANGES IN ELEVATION. THE CONTRACTOR SHALL INCORPORATE THESE INTO HIS BID AND COORDINATE THE EXACT ROUTING.
  - C. COORDINATE SUB-BASEMENT WORK WITH PHASED WORK IN BASEMENT.

- CODED NOTES:**
- ① ROUTE PCHWS&R PIPING UP THRU FLOOR TO BASEMENT, 8 PLACES TOTAL. CORE DRILL AND FIRESTOP.
  - ② NEW PIPING WILL REQUIRE MULTIPLE OFFSETS TO AVOID EXISTING CONDITIONS. REVIEW EXISTING CONDITIONS PRIOR TO BIDDING PROJECT. SUPPORT FROM STRUCTURE.
  - ③ TIE INTO EXISTING 2" PROCESS CHILLED WATER VALVES, BOTH SUPPLY AND RETURN. PROVIDE REDUCERS TO TRANSITION TO BRANCH PIPE SIZE.
  - ④ TIE INTO EXISTING 1-1/2" PROCESS CHILLED WATER VALVES, BOTH SUPPLY AND RETURN. PROVIDE REDUCERS TO TRANSITION TO BRANCH PIPE SIZE.

**PARTIAL SUB-BASEMENT  
HVAC PIPING PLAN**  
SCALE: 1/8" = 1'-0"  
1

<div>Bid Issue</div> <div>Revisions:</div>		<div>01/17/14</div> <div>Date</div>		<b>CONSULTANTS:</b> <div><div>EGH</div><div>2217 East 9th Street, Suite 350 Cleveland OH 44115-1257 216-875-0100/ (F) 216-875-0111 barberhoffman.com</div><div><div>BH</div><div>BARBER &amp; HOFFMAN, INC.</div><div>Consulting Engineers</div></div></div>		<div><div>STATE OF OHIO</div><div>BRIAN WIDOWSKI 666025</div><div>Professional Engineer</div><div>FFH 113022</div></div>		<b>ARCHITECT:</b> <div><div>Perspectus</div><div>architecture</div><div>13212 Shaker Square Suite 204 Cleveland, Ohio 44120 P. 216.752.1800 F.216.752.3833</div><div>DESIGN AND CONSTRUCTION DOCUMENTS ARE INSTRUMENTS OF SERVICE ARE GIVEN IN CONFIDENCE AND REMAIN THE PROPERTY OF PERSPECTUS ARCHITECTURE. THE USE OF THIS DESIGN AND THESE CONSTRUCTION DOCUMENTS FOR PURPOSES OTHER THAN THE SPECIFIC PROJECT NAMED HEREIN IS STRICTLY PROHIBITED WITHOUT THE EXPRESSED WRITTEN CONSENT OF PERSPECTUS ARCHITECTURE.</div></div>		<div>Drawing Title</div> <div>PARTIAL SUB-BASEMENT HVAC PIPING PLAN</div> <div>Approved: Project Director</div>		<div>Project Title</div> <div>EXPAND AND RENOVATE NUCLEAR MEDICINE AND RADIOLOGY</div> <div>Location</div> <div>VAMC - WADE PARK</div> <div>Date</div> <div>1-17-2014</div> <div>Checked</div> <div>BMW</div> <div>Drawn</div> <div>DAD</div>		<div>Project Number</div> <div>541-14-101</div> <div>Building Number</div> <div>1</div> <div>Drawing Number</div> <div>1-H6</div> <div>Dwg. of</div> <div></div>		<div>FULLY SPRINKLERED</div> <div>Office of Facilities Management</div> <div>Department of Veterans Affairs</div>	
--	--	-------------------------------------	--	--	--	--	--	--	--	---	--	---	--	--	--	---	--



KEY PLAN - BASEMENT  
Scale = None



EAST PENTHOUSE HVAC PLAN  
SCALE: 1/4" = 1'-0"  
0' 2' 4' 8' 16'

1

- CODED NOTES:**
- 1 EXISTING AHU E-0-1 SERVES THE NEW NUCLEAR MEDICINE PROJECT. REBALANCE AHU E-0-1 AIRFLOW TO ACCOMMODATE THE ADDITIONAL 18,000 CFM SERVING THE NEW NUCLEAR MEDICINE PROJECT. RESET THE MINIMUM OUTSIDE AIR TO 30% OF MAXIMUM UNIT SUPPLY CFM.
  - 2 FURNISH AND INSTALL CHEMICAL TREATMENT TO HEATING HOT WATER SYSTEM. RESET DIFFERENTIAL PRESSURE SETPOINT FOR HEATING HOT WATER PUMPS TO MEET FLOW REQUIREMENTS OF PROJECT.
  - 3 THREE EXISTING PUMPS AND TWO EXISTING HEAT EXCHANGERS MAKE-UP THE HEATING HOT WATER REHEAT SYSTEM SERVING THIS PROJECT AS WELL AS ADJOINING AREAS IN THE BASEMENT. CONFIGURE AND COMMISSION CONTROLS AND NEW PRESSURE SENSOR FOR THIS SYSTEM.
  - 4 EXISTING DIFFERENTIAL PRESSURE SENSOR. MODIFY CONTROLS TO USE THE NEW DIFFERENTIAL PRESSURE SENSOR TO CONTROL THE PUMP VFDS IN LIEU OF THE EXISTING SENSOR.

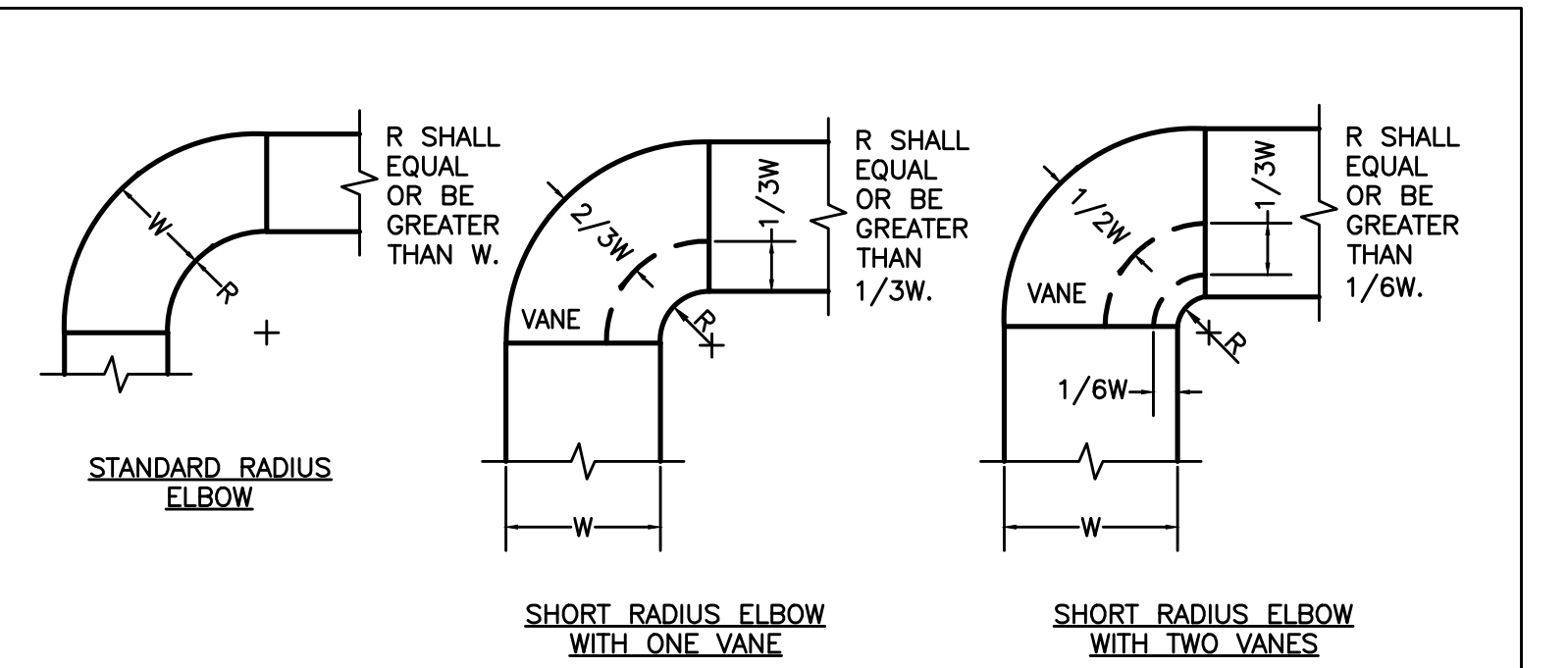
FULLY SPRINKLERED

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--







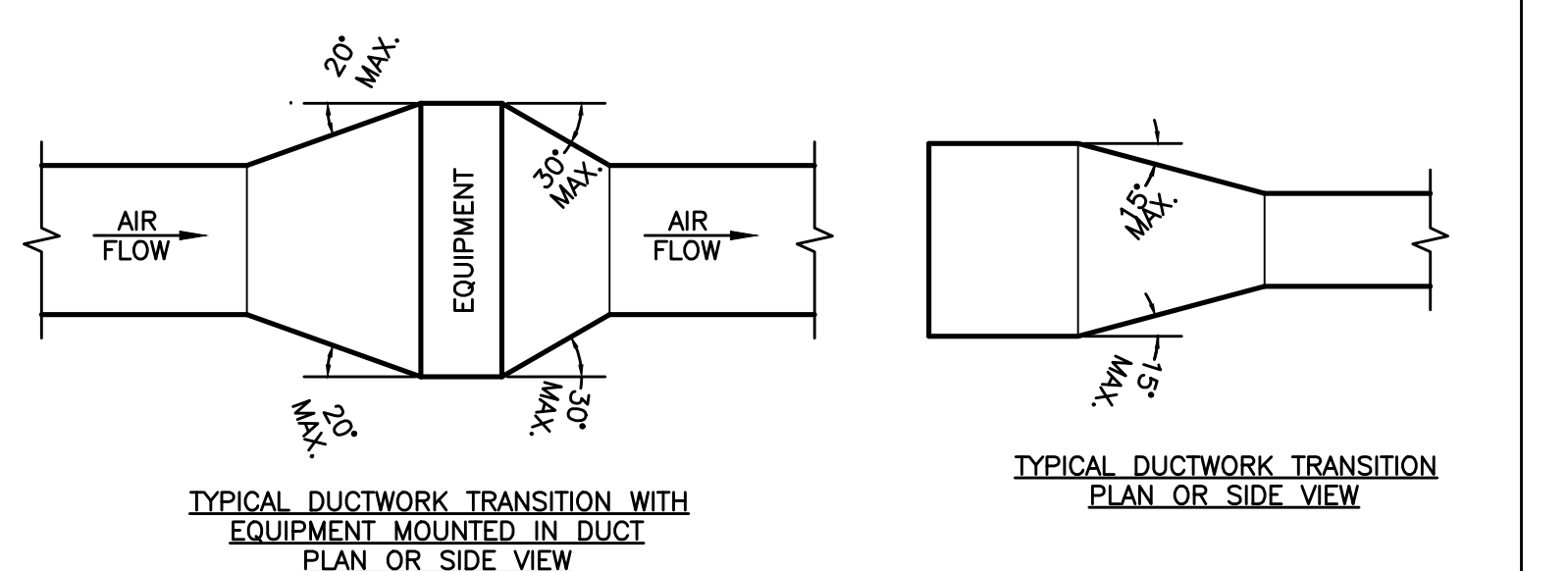


**NOTE:** THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.

ALL STANDARD RADIUS ELBOWS SHOWN ON FLOOR PLANS MAY BE MADE SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

PROVIDE DUCT ACCESS DOORS BEFORE AND AFTER EACH ELBOW.

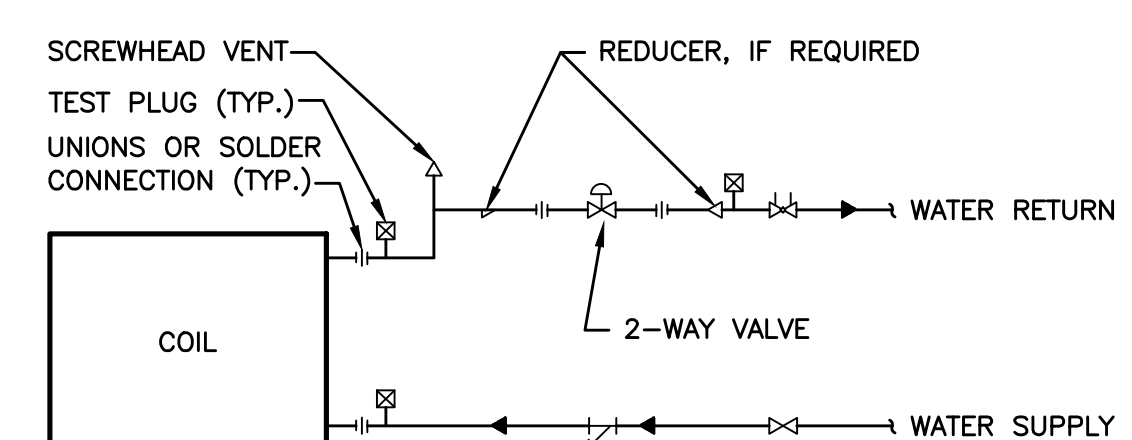
## NTS



### TYPICAL DUCTWORK TRANSITION WITH EQUIPMENT MOUNTED IN DUCT

**NOTE:**  
UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

NTS

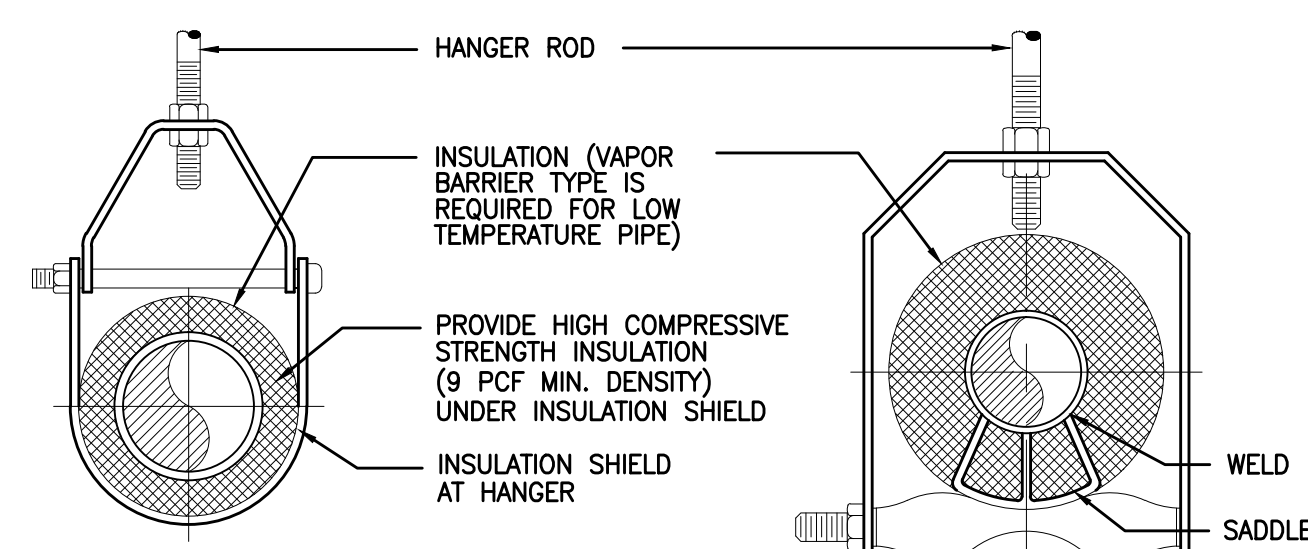


### TYPICAL COIL PIPING CONNECTIONS VAV AND DUCT-MOUNTED REHEAT COILS

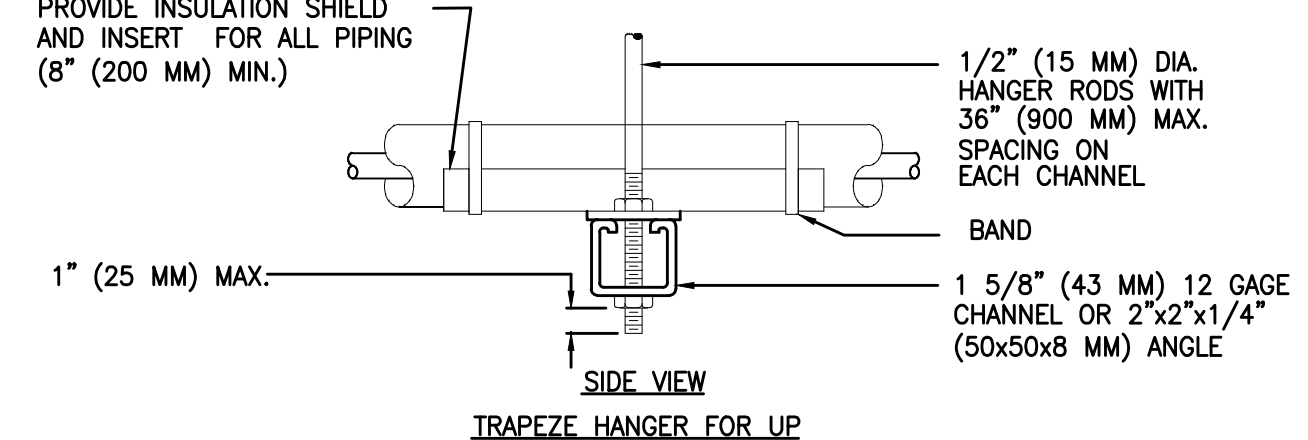
NTS

NOTES:

1. BRANCH PIPING VALVES SHALL BE PROVIDED WITH PACKING GLANDS.



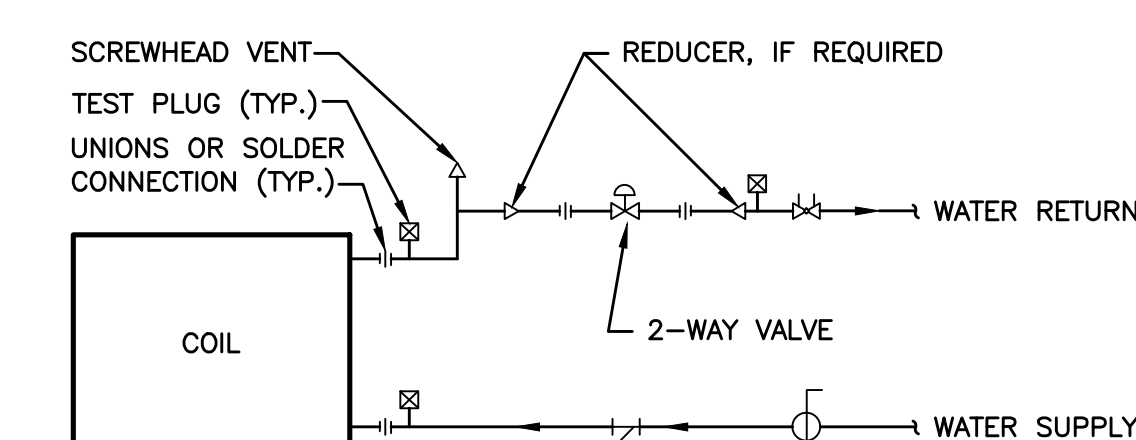
<u>ADJUSTABLE CLEVIS HANGER</u> <u>TYPE 1 – SEE SPECIFICATIONS</u>	<u>ADJUSTABLE CLEVIS HANGER</u> <u>TYPE 43 – SEE SPECIFICATIONS</u>
---	--



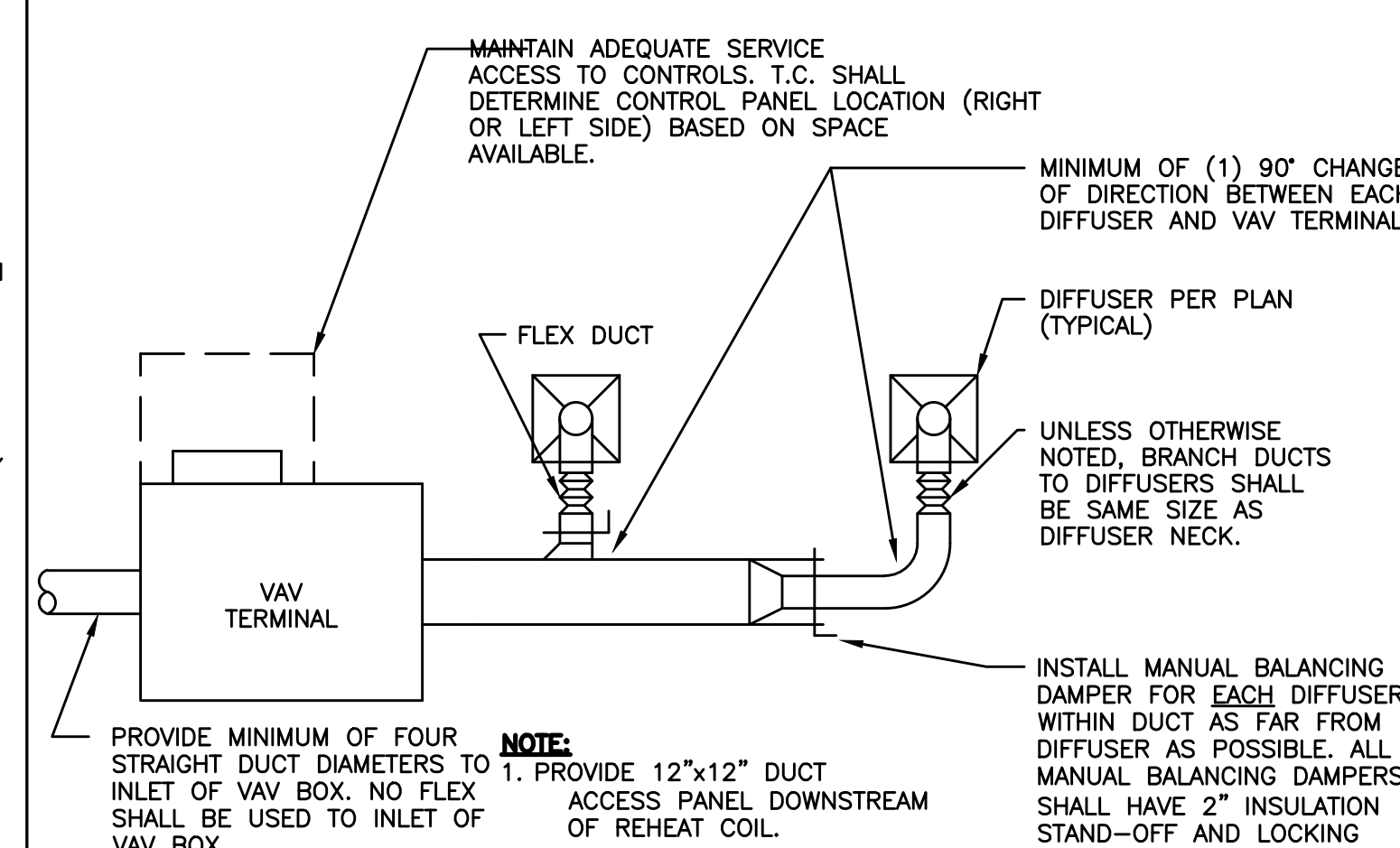
## TYPICAL PIPE HANGERS

MAXIMUM PIPE/TUBING SUPPORT SPACING														
NOM. SIZE	IN.	THRU	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	200
	(MM)	(3/4)	(20)	(25)	(32)	(40)	(50)	(65)	(83)	(100)	(125)	(150)	(200)	
PIPE	FT	(2.1)	(2.1)	(2.1)	(2.7)	(3.0)	(3.4)	(3.7)	(4.1)	(4.9)	(5.2)	(5.8)	(6)	
TUBING	FT	5	FT	6	7	8	8	9	10	12	13	14	16	
	(M)	5	FT	(1.8)	(2.1)	(2.4)	(2.4)	(2.7)	(3.0)	(3.7)	(4.0)	(4.1)	(4.9)	
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.														

NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE

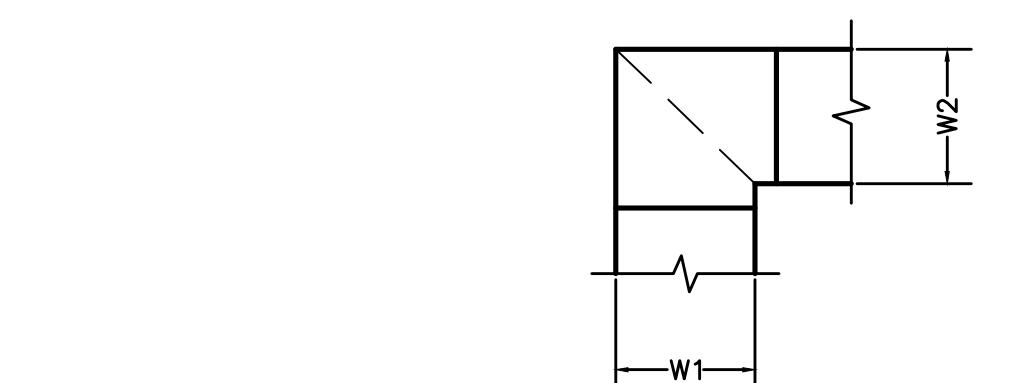


## NTS



### VAV TERMINAL DETAIL

NTS

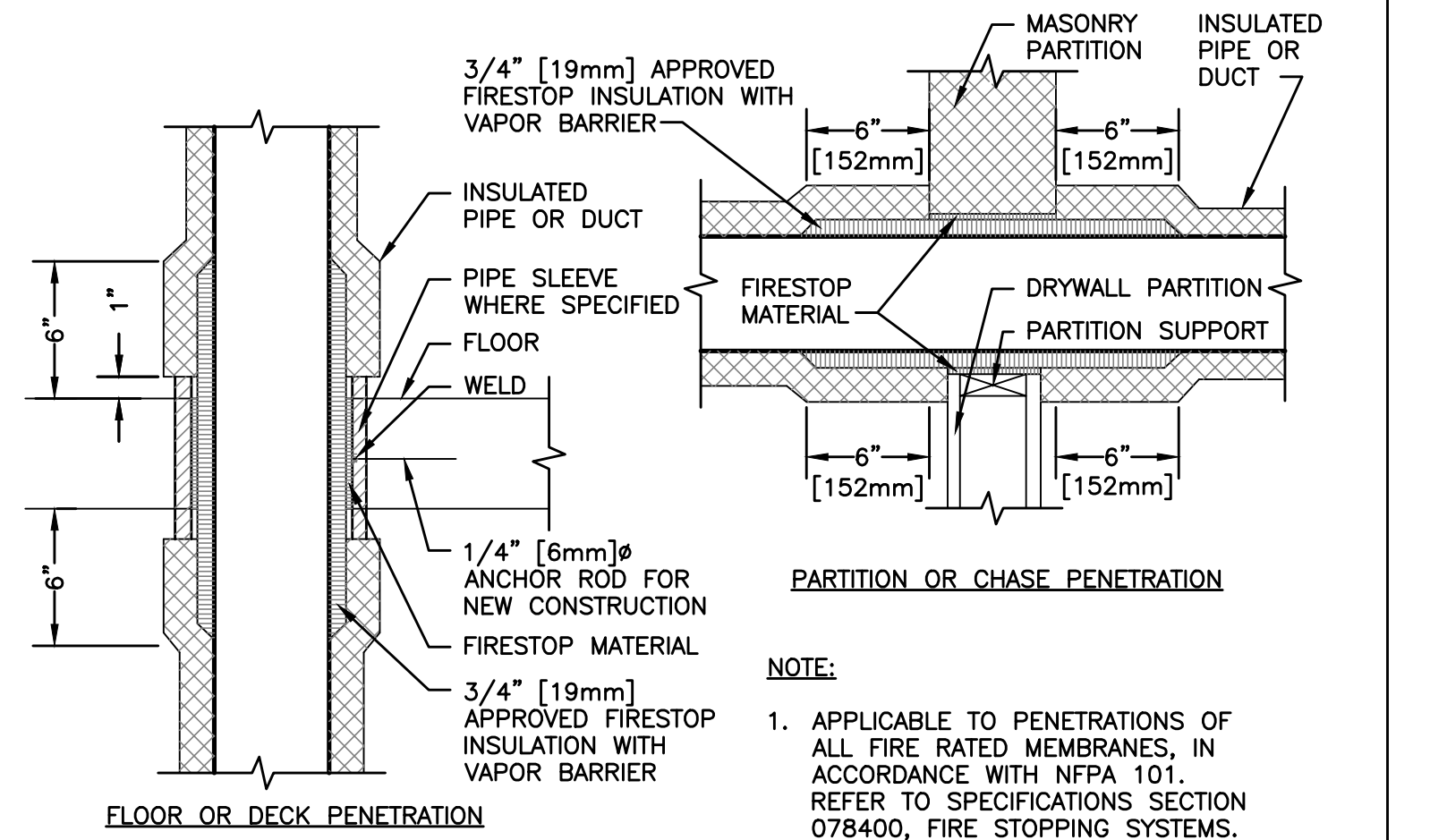


NOTE:

1. ALL VANED ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.
2. WHEN W1 DOES NOT EQUAL W2, VANE SHALL BE SINGLE VANE TYPE REGARDLESS OF W DIMENSION.
3. ALL SINGLE VANES SHALL HAVE A 2" [50mm] RADIUS, 1 1/2" [40mm] MAXIMUM SPACE BETWEEN VANES AND A 3/4" [20mm] TRAILING EDGE.
4. WHEN W EQUALS W2 AND W1 IS GREATER THAN 20" [500mm] VANES SHALL BE DOUBLE VANE TYPE.
5. PROVIDE DUCT ACCESS DOORS BEFORE AND AFTER EACH ELBOW.


### DUCTWORK SQUARE VANED ELBOWS

NT



## PIPE/DUCT PENETRATION OF FIRE/SMOKE BARRIERS

NT

Project Title <b>EXPAND AND RENOVATE NUCLEAR MEDICINE AND RADIOLOGY</b>			Project Number <b>541-14-101</b>		<div>Office of Facilities Management</div> <div>  <div>Department of Veterans Affairs</div> </div>
Location <b>VAMC - WADE PARK</b>			Building Number <b>1</b>		
Drawing Number <b>1-H9</b>			Dwg. of		
Date <b>1-17-2014</b>	Checked <b>BMW</b>	Drawn <b>DAD</b>			



